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Complete Specification Left, 30th Jan., 1901—Accepted, 20th Apr., 1901

PROVISIONAL SPECIFICATION:

Improvement in Driving Belt and Method of Manufacturing the same.

I, JOHN WESLEY HYATT, of No. 141 Commerce Street, in the City of Newark, County of Essex, State of New Jersey, U.S.A., Engineer, do hereby declare the nature of this invention to be as follows:

The nature of the present invention consists in certain improvements in the construction of driving belts of fibrous material, by which a core of longitudinal strands is enveloped in a wrapping of transverse strands, and the whole bound together by longitudinal rows or stitches. The longitudinal strands in my improved belt sustain the draft or pull upon the belt, while the enveloping strands in connection with the rows of stitches sustain the strain upon the belt-fastener and adapt the belt to be coupled by any ordinary means.

The invention is applicable to flat or round belts, the enveloping strands in either case being wrapped around the core-strands and lightly cemented thereto.

In the manufacture of flat belts, the invention is preferably performed by first making a fabric of tubular form and then flattening the same and stitching the strands together.

The belt is manufactured in tubular form by leading the core-strands continuously along all sides of a cylindrical mandrel, and wrapping the enveloping strands around the same by suitable agencies as they are drawn forward, by which means the fabric can be made with great rapidity and cheapness.

The core-strands are preferably moistened upon the exterior with some composition containing glue, so that the enveloping strands may adhere to the core and hold the fabric together prior to and during the sewing operation.

The belt is finished by saturating it with viscid composition which operates to cement all the fibres together elastically, and protect the same from moisture and abrasion, while it effects a cohesion of the fibres which prevents them from ravelling when cut.

One of the principal defects in belts formed of longitudinal strands is the difficulty of engaging such strands by a belt fastener when coupling the ends of the belt, but such defect is wholly overcome in the present construction by the use of the transverse strands, and of longitudinal rows of stitching to secure them to the longitudinal strands.

I am aware that cords have been covered with braiding and fibrous wrappings, and do not therefore claim the mere combination of longitudinal and transverse strands.

In no previous construction have the transverse strands been connected with one another by rows of longitudinal stitching, and this feature of construction in a driving belt enables the belt fasteners to get a firm grip upon the fabric, which is otherwise impossible.

From the above description it will be seen that the article comprises a core of longitudinal strands, a continuous wrapping of transversely disposed strands about such core, and longitudinal rows of stitches transverse to the enveloping strands.

The method of manufacture consists in first forming the core of longitudinal

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strands, second, wrapping the transverse strands about the same, and third, sewing the longitudinal rows of stitches through the belt; the belt if tubular being flattened before the stitches are applied.

Dated this 14th day of June, 1900, at 70 Nassau Street, New York, N.Y.,
U.S.A.

THOMAS S. CRANE
Agent for Applicant.

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COMPLETE SPECIFICATION.

Improvement in Driving Belt, and Method of Manufacturing the same.

I, JOHN WESLEY HYATT, of No. 141 Commerce Street, in the City of Newark, 10
County of Essex, State of New Jersey, U.S.A. Engineer, do hereby declare the
nature of this invention and in what manner the same is to be performed, to
be particularly described and ascertained in and by the following statement:

The object of the present invention is to produce a driving belt cheaper than
leather belts and superior in quality to the various substitutes for leather belting 15
now in use; and the construction is designed to furnish a belt fabric having
great tensile strength, great adhesion to the driving pulleys, and a structure
adapted at all points to retain a belt fastener with great tenacity.

The fabric of the belt is made of fibrous yarns or strands laid parallel to one
another, in distinction from those fabrics in which the yarns are woven or 20
braided, and cotton is preferably used on account of the facility with which it
may be worked.

The longitudinal strands which form the core of the belt are enveloped by
a continuous wrapping of strands, and longitudinal rows of stitches are extended
across such enveloping strands to bind the whole together. 25

The longitudinal strands sustain the draft or pull upon the belt, while the
enveloping strands in connection with the rows of stitches sustain the strain
upon the belt fastener and adapt the belt to be coupled by any ordinary
means.

Flat belts of this construction can be manufactured with great rapidity by 30
first making a fabric of tubular form and then flattening the same and stitching
the whole together. The belt is manufactured in tubular form by leading the
core strands along all sides of a cylindrical mandrel and the enveloping strands
wrapped around them by suitable agencies, by which means the fabric can be 35
made with great rapidity. The core strands are preferably moistened with
some composition containing glue so that the enveloping strands may adhere
to the core and hold the fabric together during the stitching operation. The
treatment of the core strands increases the tensile strength of the belt by
cementing the fibres of the strands together elastically, and also prevents them
from ravelling when the belt is cut. The surface of the belt may be treated 40
with a suitable drying oil or composition, as any well known belt-filler, to
secure the adhesion of the belt to the driving pulley.

One of the principal defects in belts formed of longitudinal strands, is the
difficulty of engaging such strands firmly by a belt fastener when coupling the
ends of the belt; but such defect is wholly overcome in the present construction, 45
by the use of the enveloping strands and of longitudinal rows of stitching to
secure the enveloping strands together.

The invention will be understood by reference to the annexed drawing, in
which Fig. 1 is a cross section of the belt without the longitudinal stitching;
Fig. 2 a cross section of the tube from which the belt is formed and the mandrel 50
upon which it is made. Fig. 3 is a plan of the belt; Fig. 4 is a cross section

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on line 4, 4, in Fig. 3, and Fig. 5 is a diagram partly illustrating the manufacture of the belt. Figs. 6 and 7 show a round belt of similar diameter.

a denotes the longitudinal strands of the belt, *b* the enveloping strands, and *c* the stitches extended longitudinally across the strands *b*. The diagram in Fig. 5 is intended merely to show the means used for disposing the longitudinal strands in a tubular form and wrapping the strands *b* about them. *d* denotes a stationary mandrel upon which the longitudinal strands are assembled by leading them from spools *e* through holes *f* in a stationary guide *g*. *h* designates a stationary chambered collar supported about the mandrel and its interior supplied with liquid glue through a tube or passage *i*.

The strands *a* are drawn by rollers or suitable means continuously through the collar *h*, being pressed thereby upon the mandrel *d*, and the exterior of the strands lightly coated with glue.

Just beyond the mandrel the enveloping strand *b* is applied by a carrier rotated so as to wind the strand *b* in a continuous spiral coil upon the surface of the strands *a*. The glue causes the enveloping strands to adhere to the longitudinal strands, and the tubular fabric when dried is pressed into flat form, as shown in Fig. 1, and the longitudinal rows of stitches *c* are applied as represented in Fig. 3, and lock the enveloping strands together and to the strands *a*.

The longitudinal strands are not adapted to sustain the pull of the belt fastener, but when the end of the belt is pierced through or between the transverse strands for inserting a lacing or metallic fastener, as shown at the holes *j* in Fig. 3, the enveloping strands between the holes and the end of the belt serve to sustain the pull upon the fastener, as such strands are locked by the stitches *c* to the strands farther back on the belt, and the stitches are cemented by the dried oil or belt-filler to the longitudinal strands below. The strength of the longitudinal strands is thus fully utilized in connecting the fastener.

In a belt two inches wide, forty longitudinal strands are used, or two layers of twenty each, which with the enveloping strands makes a belt about quarter of an inch thick. Each of the forty strands, if of cotton, has a tensile strength above fifty pounds, although strands are used which have very little twist, to avoid the stretching of the belt, in use. The tendency of each strand to stretch is in proportion to the closeness of its twist, and the straightness of the fibre in the strands thus obviates the tendency of the belt to stretch under tension when in use.

The round belt shown in cross section in Fig. 6 and in elevation in Fig. 7, is made by drawing a cylindrical core of the yarns through suitable guides between which the wrapping strands *b* are applied with or without glue to secure them, as may be desired. The round cord or belt thus formed is then sewed with two lines of stitches *c* at right angles to one another, as indicated in Fig. 1, and treated with a drying oil, as already described.

To complete the manufacture, the belt is stretched beyond the normal tension desired in use, and owing to the straightness of the longitudinal strands they are not subject to stretch further when in use.

From the above description it will be obvious that the belt has a tensile strength much higher than leather of the same cross section, and has a number of qualities to render it superior to leather for a driving belt. The essential feature of the invention is the construction of the belt or band with a core of longitudinally disposed fibres and a wrapping of transverse strands secured to the same, as by the stitches *c*, and it is obvious that the method of manufacture is immaterial.

I have however claimed the method of manufacturing a flat belt by first forming a tube and then flattening and sewing such tube, as it is a convenient and rapid method of producing the fabric; but it is obvious that the cores may be made in flat shape and the enveloping strands wrapped around them by suitable means. By manufacturing the flat belt first in the form of a tube, it can be made much more rapidly and cheaply than canvas belts in which the

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fabric must be first woven before its layers are united together. The winding of the core in my invention can be performed with much greater rapidity than the weaving of all the layers required in a canvas belt, and my construction is thus much more cheaply produced while in practice it possesses all the required qualities.

In my invention, the enveloping strands are preferably disposed in contact with one another, to form a perfectly flat layer upon the surface of the belt, and are not braided or woven, or otherwise crossed upon one another.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. A belt or band comprising a core of longitudinal strands, a continuous wrapping of transversely disposed strands about such core and longitudinal rows of stitches transverse to the enveloping strands.

2. A belt or band comprising a core of longitudinal strands, a continuous wrapping of transversely disposed strands cemented upon the surface of the longitudinal strands, and longitudinal rows of stitches transverse to the enveloping strands.

3. A belt or band comprising a core of longitudinal strands, a wrapping of transverse strands, longitudinal rows of stitches binding the transverse and longitudinal strands together, and a belt-filler or drying-oil adapted to cement all the fibres together, as and for the purpose set forth.

4. The method of forming a fibrous belt or band, which consists in first forming a tube of longitudinal strands enveloped by surrounding strands, second, flattening such tube, and third, sewing longitudinal rows of stitches through the flattened band to secure the enveloping strands to the longitudinal strands, as and for the purpose set forth.

Dated at 70 Nassau Street, New York, N.Y. this Eighth day of January, 1901.

THOMAS S. CRANE
Agent for Applicant.

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Fig. 2.

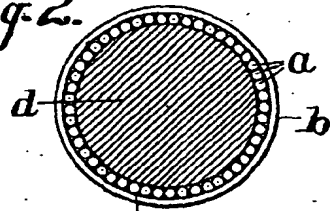


Fig. 1.

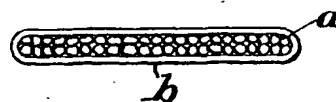


Fig. 3.

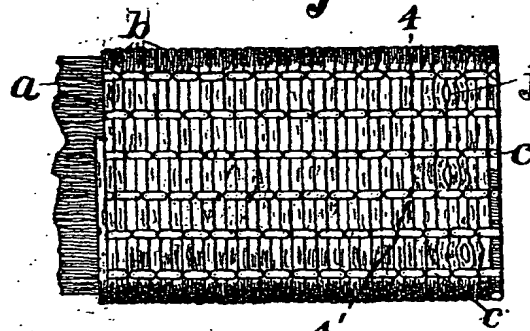


Fig. 4.

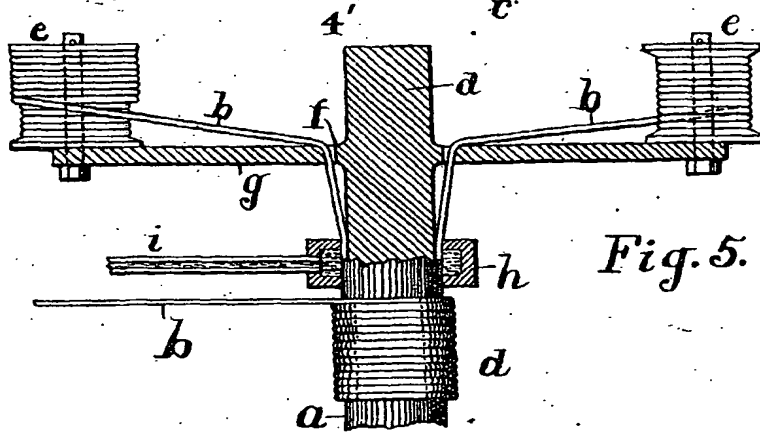
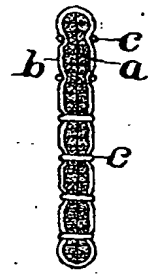


Fig. 5.

Fig. 6.



Fig. 7.



[This Drawing is a reproduction of the Original on a reduced scale.]

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